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. . . in this issue

Model Standards Development

By Carol Hockert

In a previous issue of the *W&M Quarterly* newsletter, the seven strategic objectives of the Weights and Measures Division were outlined. One of these objectives is to improve the standards development process for standards related to weights and measures. An improved understanding of the standards development process will improve the quality of both the process and the resulting standards and may increase participation in standards development within the weights and measures community.

In order to improve the standards development process, it is important to first understand the current process. NCWM Chair-elect Judy Cardin has given a presentation at regional weights and measures association meetings on the current NCWM process. Juana Williams (WMD) has written a comprehensive article on how to craft a well-developed technical proposal with the current process, and the introduction of that article is published in this edition of the *W&M Quarterly* newsletter. The entire article can be found on the NIST/WMD website and will be emailed to you upon request.

It may also be helpful to examine the process followed by other standards developing organizations (SDOs). In the United States, the American National Standards Institute (ANSI) has developed rules for SDOs to follow and accredits SDOs that meet the specified requirements. The American Society for Testing and Materials (ASTM) is an example of an ANSI-accredited SDO. ANSI also represents the United States in the International Standards Organization (ISO) and the International Electrotechnical Commission (IEC).

In order to be accredited by ANSI, an SDO must meet all of the Essential Requirements listed below. The Essential Requirements are intended to assure due process, which means that any person or organization with an interest has a right to participate, thus providing equity in the standards development process.

Openness

- Participation is open to all persons who are affected.
- There is no undue financial barrier to participate.

Lack of dominance

- Dominance means a position of dominant authority or influence by reason of leverage to the exclusion of fair and equitable consideration of other viewpoints.
- Any single interest category cannot dominate the development of a standard. Categories include producers, users and general interest groups. Users are further defined as consumers, industry, government, and labor.

Balance

- There should be a balance of interests.
- Participants from diverse interest categories shall be sought.

Notification of standards development and coordination

- Standards activity shall be announced in suitable media to demonstrate an opportunity for participation by all directly affected persons.

Consideration of views and objections

- Prompt consideration shall be given to written views and objections of all participants.

• Comments may be received for a minimum of 30 days after publication.

• Objections should be addressed in writing.

Consensus vote

• Votes may be by letter, fax, recorded votes at a meeting, or by electronic means. ALL members of a consensus body shall have the opportunity to vote.

• Quorum requirements must be defined.

• "No" votes must have comments included to be considered.

Appeals

• Written procedures shall contain a realistic appeals mechanism.

• Appeals must be addressed with impartial handling.

• Appeals must include challenges to whether or not there was due process.

Written procedures

• SDOs must have documented procedures governing the process.

Compliance with normative American National Standards policies and administrative procedures

• Normative policies are established by the ANSI Executive Standards Council.

• ANSI-accredited SDOs must comply with these.

Each SDO determines how it will meet the Essential Requirements and writes its own policies and procedures. These procedures define who may vote, the size of the consensus body, quorum requirements, notification methods, the appeals process and more. There are over 200 ANSI-accredited SDOs in the United States. For more information on ANSI, the Essential Requirements, and how to meet them, please see www.ansi.org.

Standards development is an important part of the weights and measures infrastructure. Weights and measures officials have direct input into these standards, so increasing their knowledge should lead to a better process and product.

. . . in the field

New WMD EPOs for Commercial Mechanical and Electronic Jeweler and Prescription Scales

By Juana Williams

NIST WMD has completed development of Examination Procedure Outlines Number 5 "Mechanical Equal Arm Jeweler and Prescription Scales" and Number 5E "Electronic Jeweler and Prescription Scales." Both EPOs are currently available on request and will be made available on the WMD website at http://www.nist.gov/owm shortly. The EPOs are the newest guide for the field examination of jeweler and prescription scales and will appear in the next edition of NIST Handbook 112.

Developed by Richard Harshman and Juana Williams of WMD's Legal Metrology Devices Group, the EPOs include the minimum inspection and test procedures for jeweler and prescription scales, with code references to NIST Handbook 44 "Specifications, Tolerances, and Other Technical Requirements for Weighing and Measuring Devices," (2007 Edition). Each EPO contains seven sections: (1) *Safety Notes* to alert the inspector to potential safety hazards and possible sources of damage to equipment; (2) an *Equipment List* to ensure adequate standards and special equipment are available prior to the test; (3) an *Inspection* section, which covers design and installation requirements; (4) *Pretest Determinations*, which help in determining accuracy limits and other points to consider prior to the test; (5) *Test Notes* that identify actions taken or information to be gathered during the test; (6) *Test*, a section that outlines the steps followed to determine the accuracy of a device; and (7) an *Appendix*, which provides conversion tables for units of measurement commonly indicated on these devices. EPO 5E also includes detailed inspection and test procedures for verification of the counting feature on prescription scales. The EPOs include comprehensive descriptions on how to verify features such as the automatic zero-setting mechanism and how to perform discrimination and shift tests, while keeping to the step-by-step procedural outline familiar to the weights and measures community.

The EPOs were developed with the assistance and generous contributions of time, equipment, and effort by members of the weights and measures community. Thanks to Brian Christopher (McKesson Corporation) and Darrell Flocken and Scott Davidson (Mettler-Toledo, Inc.) who provided equipment used in training sessions and in the verification of test procedures. We also wish to express our appreciation to Thomas Adkins, John Junkins, and Elvin Kelly, Jr. (West Virginia), Andrea Buie (Maryland), Gary Castro (California), William Fishman (New York), Maxwell Gray, William Jones, Donald Minter, and Alan Walker (Florida), Jerry L. Clingamen, Jr. (Indiana), James L. Richter (Appleton, Wisconsin), William Sechrest (Madison, Wisconsin), and William West (retired Ohio) for their input and field trials of the EPOs. A special thanks to our colleagues at NIST WMD—Kenneth Butcher, Tina Butcher, Steven Cook and Val Miller—for their guidance and reviews of the procedures.

Device Inspection - Where to Find Help

By Rick Harshman

A proper device examination is one in which all applicable NIST Handbook 44 (HB-44) requirements have been properly applied. Approval of a commercial weighing or measuring device is appropriate only when it has been determined through complete and proper examination that the device conforms to all applicable HB-44 requirements. This includes not only compliance with accuracy or performance requirements, but also design, maintenance, and user requirements. The importance of verifying that weights and measures equipment comply with all applicable HB-44 requirements is imperative, as is knowing the resources available to gain knowledge on the correct interpretation and application of HB-44 requirements.

Why is it that many field officials tend to place a greater emphasis on verifying the performance and accuracy of devices (i.e., making certain they have followed proper testing procedures and correctly applied applicable tolerances) than on the inspection of devices (i.e., verifying compliance with design, maintenance, and user requirements)? Although device accuracy is an extremely critical factor in the final establishment of accurate weighing or measuring results, it is of no greater importance, in that regard, than is proper design, maintenance, and use of a device. After all, final measurement results are affected by more than device accuracy alone. Any number of deficiencies relating to device design, maintenance, and use can also affect final results. Thus, placing a greater emphasis on testing *versus* inspection of devices is unacceptable. It is only through complete and accurate application of *all* applicable requirements that the "purpose" of HB-44 technical requirements can properly be achieved.

The purpose of these technical requirements is to eliminate from use, weights and measures and weighing and measuring devices that give readings that are false, that are of such construction that they are faulty (that is, that are not reasonably permanent in their adjustment or will not repeat their indications correctly), or that facilitate the perpetration of fraud, without prejudice to apparatus that conforms as closely as practicable to the official standards.

Purpose of HB-44 Technical Requirements
(Excerpt from the Introduction of HB-44)

Weights and measures administrators and field officials alike share a key responsibility of ensuring that all applicable HB-44 requirements are applied and are applied correctly. The consequences of failing to take this responsibility seriously can be severe, especially if unfair enforcement actions are taken based upon examination results that are either unreliable or incomplete. Also, if deficiencies are going unnoticed, they have the potential of resulting in extreme financial loss (or gain) to the device owner or his/her customers. What steps can field officials take to help ensure they are conducting complete device examinations? What resources are available to help field officials gain the knowledge necessary to enable them to apply all requirements and test procedures properly? What actions can administrators take to best support field officials in their efforts?

Field officials must possess a thorough understanding of all requirements and test procedures applicable to each device type they will be examining to enable them to apply those requirements and test procedures properly. They must also be familiar with the correct operation of the devices they examine, including the purpose and function of any operational controls or features that may exist on those devices. Service personnel, too, must have knowledge of applicable requirements to enable them to correctly service equipment so that it complies with applicable requirements. There are plenty of resources available to help field officials and service personnel gain the necessary knowledge in this regard. The following bulleted list describes many of the resources made available by NIST:

NIST Examination Procedure Outlines (EPO's): NIST WMD has developed EPOs for most of the more common device types to make it easy for field officials to ensure they are conducting complete device examinations. Each outline describes the *minimum* examination preceding official action and is not intended to preclude officials from conducting additional testing or repeating tests as part of the examination process should the inspector determine additional testing is warranted. Thus, by consulting the appropriate EPO corresponding to the device being examined, and applying all of the requirements outlined, field officials can be assured they have performed a minimum acceptable examination. They may also repeat tests or conduct additional tests as needed. It is important to note that the EPO's are intended to reference every HB-44 requirement that could possibly apply to a particular device type used under any application. However, since some operational features of a device may be dependent upon a particular application, all requirements referenced in an EPO may not apply to every device of the type being examined. Service companies may also find the EPOs of use in identifying those tests and criteria that will be applied by the weights and measures official.

Note: Although NIST Handbook 112 (HB-112) contains all of the EPOs that WMD had developed as of 2002, WMD has since developed EPOs for some additional device types, which are not included in HB-112. Additionally, many of the EPOs that are in HB-112 have recently been updated by WMD to reference requirements contained in the 2007 edition of HB-44. For this reason, it is recommended that anyone seeking the most current version of an EPO contact WMD. Once WMD has completed the updates to all of the EPOs, they will be made available on WMD's website.

- ***NIST Training Seminars***: Members of WMD's Legal Metrology Devices Group (LMDG) routinely present training seminars to officials and service personnel on proper device examination. The specific types of devices covered and the locations of these seminars are based upon the training needs of the various states, in particular, those states whose state director responds to WMD's annual request for input on training needs. Seminar duration typically ranges from approximately one to five days depending upon the topic and the degree of instruction requested. Topics and locations of upcoming NIST training seminars are listed regularly in this newsletter (i.e., *Weights & Measures Quarterly* newsletter) under the heading "Calendar of Events." Many of the presentations and much of the course material from recently completed NIST training seminars is currently available online. To access this information, go to the NIST WMD website at www.nist.gov/owm and click on "NIST/Weights and Measures Training." Then select the appropriate "interface link" to access the desired training module.

- ***Inspector Manuals***: Inspector manuals provide detailed information regarding the history, purpose, and application of HB-44 requirements as they relate to the particular device type for which the manual applies. These manuals also provide information about the design, application, and use of the device. These manuals are

extremely useful in determining correct interpretations and applications of HB-44 requirements as they relate to a particular type of device. Each manual is subdivided into several chapters allowing information to be located quickly and easily. Inspector manuals have been developed for many different device types. Some are currently available online and included in the course material currently offered on the "NIST/Weights and Measures Training" page of WMD's website. To access the manuals available online, click on the appropriate "interface" button from the "NIST/Weights and Measures Training" page for the device type desired. Then download the chapters needed by selecting the "PDF" or "Word" format. To inquire about other Inspector manuals not available online, contact WMD's Rick Harshman using the contact information provided at the end of this article.

• ***Weights & Measures Quarterly Newsletter***: Members of the LMDG regularly write technical articles relating to proper device examination, which are often featured in WMD's *Weights & Measures Quarterly* newsletter. Many of these articles list and explain proper procedures to be used, provide correct interpretations of HB-44 requirements, and offer other relevant information a field official would need to know to perform a proper device examination. Information in these articles can also be of use to weights and measures administrators in understanding the resources and information required by the field official. Likewise, service companies can gain benefit from this information because it provides better understanding of the requirements and test procedures officials should be applying to equipment in the field. An index of these technical articles by device type is available on WMD's website to enable users to easily locate related articles appearing in previous editions of this newsletter. To access the index, go to WMD's homepage and click on "*Weights and Measures Quarterly* Newsletter Archive" listed under the heading "Publications."

• ***Annual Reports of the National Conference on Weights and Measures (NCWM)***: The annual reports of the Committee on Specifications and Tolerances (S&T Committee) provide background information and related discussions on proposed changes to NIST HB-44. This information is of great benefit when trying to establish the intended application or a correct interpretation of an existing HB-44 requirement. Each Annual Report of the NCWM is published by NIST as a Special Publication. The Annual Reports of all of the National Conferences on Weights and Measures (i.e., from 1905 – 2006) have been incorporated onto a single DVD made available by NIST. This DVD includes a search feature allowing information to be searched in a variety of different ways.

• ***Field Manuals***: Field manuals are intended to provide more information and instruction than is currently available in the EPOs, yet not so much information as to diminish their usefulness as a tool for field officials. Though not posted on the WMD website, a few older field manuals including NBS Handbook 137, Examination of distance measuring devices, and NBS Handbook 117, Examination of vapor-measuring devices for liquefied petroleum gas are available. Members of the LMDG are in the process of developing additional field manuals for vehicle scales, belt-conveyor scales, and grain moisture meters.

• ***Technical Support from NIST Staff***: WMD's staff of "technical experts" is available Monday through Friday, 8:30 a.m. to 5:00 p.m. (ET) to answer questions and provide technical assistance encompassing a broad range of weights and measures issues. WMD is organized into four program areas as follows: State Laboratory Program, Device Technology Program, Laws and Metric Program, and the International Legal Metrology Program. It is recommended that inquiries relating to device inspection and HB-44 issues be directed to an appropriate expert in the LMDG, which is considered part of the Device Technology Program. A list of each LMDG member's technical responsibilities related to device inspection is included in the table on page 5. To talk with an expert, contact WMD at (301) 975-4004.

Note: WMD is currently in the process of reorganizing its website. Updated instructions for accessing the information below will be provided in a future edition of the newsletter once the reorganization is complete.

In addition to the resources made available by NIST, a number of state and local weights and measures agencies also offer periodic training schools or seminars on device inspection. Besides covering basic device inspection, this training is often offered to keep officials up-to-date on new requirements being added or changes made to existing requirements in HB-44 and new developments in device technology. Training is also made available on occasion from equipment manufacturers, who often welcome the opportunity for weights and measures officials to participate in training they extend to their own employees or those involved with the distribution or service of their equipment. This training provides an excellent opportunity for field officials to learn the many operational features of new equipment and how that equipment complies with legal requirements.

Field officials need to know their efforts are being supported by their superiors. Therefore, it is not only important for weights and measures administrators to communicate their desire for field officials to conduct complete and accurate device examinations, but it is also just as important that administrators continually demonstrate, through their actions, that they are genuinely committed to achieving this goal. There are many ways this commitment can and should be demonstrated. Below are some examples of actions that can be taken by administrators to help demonstrate this commitment:

• Provide regular opportunities for field officials to participate in training designed to increase their knowledge of HB-44 requirements and the test procedures that apply to the various devices for which they are responsible for examining.

• Make available to field officials all necessary reference material (e.g., EPOs, inspector manuals, access to technical newsletter articles, etc.).

• Allow sufficient time for field officials to conduct complete and accurate device

NIST Weights and Measures Division Legal Metrology Devices Group		
Type of Information	**Who to Contact**	**Telephone 301-975+ ext**
Publications NIST Handbook 44, *Specifications, Tolerances and Other Technical Requirements for Weighing and Measuring Devices*	Tina Butcher, Steve Cook, Rick Harshman, Diane Lee Richard Suiter, Juana Williams	2196, 4003, 8107, 4405, 4406, 3989
Measuring Devices Loading-Rack Meters LPG Meters Mass Flow Meters Retail Motor-Fuel Dispnensers (Gas Pumps) Vehicle-Tank Meters General Metering Devices	 Richard Suiter Tina Butcher Juana Williams	 4406 2196 3989
Weighing Devices Automatic Weighing Systems Belt-Conveyor Scales General Weighing Devices Vehicle & Railroad Track Scales In-Motion Scales Load Cells	 Steve Cook Juana Williams Rick Harshman	 4003 3989 8107
Other Devices Animal Carcass Measuring Devices Grain Moisture Meters & NIR Protein Analyzers OIML R 59 Grain Moisture Meters OIML TC 17/SC 8 Grain Protein Measuring Multiple Dimension Measuring Devices Taximeters and Odometers OIML R 21 Taximeters	 Richard Suiter Diane Lee Richard Suiter, Tina Butcher Juana Williams	 4406 4405 4406, 2196 3989

examinations. As officials gain experience in performing complete and accurate examinations, their speed can be expected to increase, thus reducing the amount of time it takes to perform complete examinations.

• Monitor the inspection activities of field officials to ensure examinations are complete and accurate. Provide additional guidance and training as needed to achieve the goal that was communicated.

Ensuring that all applicable HB-44 requirements and test procedures are applied properly to commercial weighing and measuring devices is a shared responsibility of administrators and field officials that can only be achieved when they are committed to working together for the common good. As detailed in this article, there are plenty of resources available to help them achieve this end. For more information regarding how to obtain any of the resources mentioned in this article contact Rick Harshman at 301-975-8107 or by email at richard.harshman@nist.gov.

Standards Development Process and Submission of Issues

By Juana Williams

Many of you attending the 2006 regional weights and measures association meetings had the opportunity to hear NCWM Chair-Elect Judy Cardin's presentation on the U.S. system for developing legal metrology standards. Chair-Elect Cardin's presentation on "Standards Development" provided an excellent overview of the system, outlining key elements in the process for submitting a proposal to add new or update existing handbook standards. Frequently, the NIST Weights and Measures Division (WMD) staff are asked what is the best approach for developing a proposal to ensure that a proposed requirement has the greatest chance of adoption. WMD has developed a comprehensive set of guidelines that focus on the initial stage of the process where a member of the weights and measures community fully develops a new proposal that is ready for submission. The seven critical components of a proposal are:

(1) New or Modified Handbook Language
Cite the new or modified handbook language in the proposal.

(2) Rationale for Change
Summarize the problem, and then state why the proposal solves the issue.

(3) Stakeholders' Positions
Solicit all stakeholders for their input on a proposed requirement and then be thorough, accurate, and frank in your report on their position.

(4) Reasons for a Standard – Regular Submission

Describe the conditions that exist from a technical standpoint that have brought about the need for a change in requirements.

(5) Reasons Against Modifying a Standard

Provide the position of stakeholders, technical information, or other findings that raise opposition or questions about the validity of the proposal or that might be the basis for supporting an alternate proposal.

(6) Background Data

Examine all historical and technical data and report on its relevance to the issue.

(7) Recommended Action

State the specific recommended course of action for that proposal at the national level.

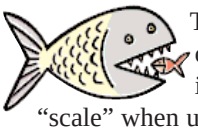
The guidelines for developing a proposal provide an in-depth look at each component that should be included in a proposed requirement when it is first submitted for national consideration. Following these guidelines will expedite movement of the proposal through the standards development process. The guidelines offer insight to newcomers in the weights and measures community and are a good refresher for technical committees developing agendas and anyone returning to the standards development process. WMD also includes illustrations to provide an overview of the yearly cycle followed in the U.S. weights and measures standards development process and to demonstrate the far-reaching impact of an adopted proposal. The guidelines also include a real-world example of a proposed requirement to demonstrate how submitters should develop a new proposal as well as a checklist to assist submitters in organizing and preparing for research on their proposals.

Due to limitations of space in this newsletter, a complete copy of the guidelines for developing a proposal for submission in the standards development process is available on the WMD website at www.nist.gov/owm. Select Weights and Measures Quarterly Newsletter Archives, and then click on “Standards Developing Process and Submission of Issues.”

Are There Scales on a Gas Pump? That Sounds Fishy to Me!

By Steven Cook

The NIST Weights and Measures Division occasionally receives inquiries about the use of the word "scale" in General Code paragraph G-S.5.2.2. (d) Digital Indication and Representation. Some liquid-measuring device owners, service agents, and manufacturers incorrectly believe this paragraph specifying specific "zero display" requirements does not apply to their devices since they are not weighing devices. This article will review some of the most common definitions of the word "scale" and how the word is used with other types of measuring equipment in Handbook 44.



The following are some of the many common definitions for the word “scale” when used as a noun:

- The epidermis of a fish.
- An ordered reference standard; "judging on a scale of 1 to 10."
- An indicator having a graduated sequence of marks.
- A measuring instrument for weighing; shows amount of mass.
- A series of musical notes differing in pitch according to a specific scheme (usually within an octave).
- Relative magnitude; "Richter Scale."
- Standard wage levels for a given type of job (e.g., a pay scale).

From an international perspective, the word "scale" is typically used when referring to an indicator or the value of an indication. For example, the International Vocabulary of Basic and General Terms in Metrology (VIM) defines a "scale" as part of a displaying device consisting of an ordered set of marks, together with any associated numbers or quantity values.

OIML R76, International Recommendation for "Non-automatic Weighing Instruments" further defined the following terms when used in the recommendation:

Scale mark (T.2.4.2)
- A line or other mark on an indicating component corresponding to a specified value of mass.

Scale base (T.2.4.3)
- An imaginary line through the "centres" of all the shortest scale marks.

Actual scale interval (d) (T.3.2.2)
- Value expressed in units of mass of:
" the difference between the values corresponding to two consecutive scale marks, for analogue indication, or
" the difference between two consecutive indicated values, for digital indication.

Verification scale interval (e) (T.3.2.3)
- Value, expressed in units of mass, used for the classification and verification of an instrument.

Scale interval of numbering (T.3.2.4)
- Value of the difference between two consecutive numbered scale marks.

OIML R117, International Recommendation for "Measuring systems for liquids other than water" uses the word "scale" in the following definition when describing the first element of an indicating device:

First element of an indicating device (T.3.17)
- Element which, in an indicating device comprising several elements, carries the graduated scale with the smallest scale interval.

As you can see, the word "scale" when used by itself or as a type of weighing device (e.g., vehicle scale) in Handbook 44 Section 2 is considered a "weighing instrument" in international documents. The word "scale" can also be part of an indicator on a weighing or measuring device when it is used with the words division, interval, indication, or increment. Fortunately, "scale" is most frequently used in the weighing device codes in Handbook 44 Section 2 where it does not matter if the word refers to a weighing or indicating device. However, the word "scale" is used in the General Code Section 1 paragraph G-S.5.2.2. as mentioned earlier and applies to both weighing and measuring devices. The word is also used in the Section 4.42. Farm Milk Tanks. describing specifications for sight gauges in para-

graphs S.3.6.3. and S.3.6.4., and in Section 4.44. paragraphs describing the markings of intervals on graduates (e.g., Single- and Double-scale graduates).

In summary, the word "scale" can be used in conjunction with both weighing and measuring devices. Thus, the term "scale" as used in General Code sub-paragraph G-S.5.2.2. (d) can apply to any weighing or measuring device in Handbook 44 when it is associated with either a digital indication or with marks on a graduated indication.

For questions about the use of the word "scale" in Handbook 44, contact Steve Cook by telephone at 301-975-4003 or by e-mail at steven.cook@nist.gov.

What's Next in Hydrogen?

By Juana Williams

Work at NIST WMD to develop legal metrology standards for hydrogen (H_2) refueling stations is expanding. In March 2007 WMD received funding as part of the American Competitiveness Initiative for its work in support of the U.S. transition to a hydrogen economy. This is the first in a series of articles on the status of WMD's work, related hydrogen issues, and information of interest to the weights and measures community.

Over the past four years Juana Williams, representing WMD and NIST, has participated in the National Hydrogen Fuel Cells Codes and Standards Coordinating Committee (NHFCCSCC). The NHFCCSCC is sponsored by the U.S. Department of Energy National Renewable Energy Laboratory, National Hydrogen Association, and U.S. Fuel Cell Council. The NHFCCSCC coordinates the development and implementation of a uniform set of H_2-related codes to ensure the safe production, delivery, and use of H_2. This collaborative effort was undertaken to make it possible for the commercialization of H_2 technology in stationary, transportation, and portable applications. The NHFCCSCC also collaborates with other national and international organizations conducting similar H_2 work.

Currently WMD is creating a long-range plan for the development of commercial H_2 measurement standards that encompasses: (1) codes; (2) method of sale requirements; (3) marking and labeling requirements; (4) quality; (5) sampling procedures; (6) inspection procedures, equipment suitability, and safety; (7) training for officials and service companies; and (8) education on H_2 measurement. WMD will need to accelerate its work to stay ahead of emerging technology and to have standards in place when the public is permitted access to H_2 refueling stations. WMD plans to establish a U.S. National Work Group (USNWG) of industry and regulatory experts as well as conduct educational workshops on H_2 measurement. Part of its outreach will be to the 17 States that already have refueling dispensers operating in support of fleet and other fuel cell vehicles.

WMD and other organizations are already at work on several standards in those key areas. In 2005 WMD developed and distributed a first draft of an H_2 Gas Meters Code. The first draft is currently posted at www.fuelcellstandards.com and is based on existing technical requirements and test procedures that apply to other commercial measuring devices similar to those used in the delivery of hydrogen. To date, comments from industry indicate the 1.5 % acceptance tolerance based on NIST Handbook 44 Section 3.37 Mass Flow Meters Code requirements for Accuracy Class 2.0 devices (those used to meter compressed natural gas [CNG] as a motor-fuel) is too stringent. Additionally, standards may be needed to address equipment that dispenses liquid H_2 or a CNG and H_2 blend. Other agencies such as the California Division of Measurement Standards are working to establish a quality standard for H_2 used by fuel cell vehicles. The multitude of national and international groups working on H_2 projects offers many opportunities for collaboration and will continue to require coordination of our efforts to avoid redundancy and nonuniform standards.

WMD has tentative plans for an August 2007 USNWG meeting and a September 2007 educational workshop. Involvement of weights and measures administrators, officials, and industry experts will be essential to developing appropriate and fair weights and measures standards. WMD will keep all stakeholders posted on these upcoming activities.

If you have questions about the standards development process or are interested in participating in a work group or workshop, please contact Juana Williams by email at juana.williams@nist.gov or by telephone at 301-975-3989.

Metrology

The Master List--A Great Tool for Document Management

By Elizabeth Gentry

I am often asked, "What documents make up our management system" and "Is there a simple and efficient way to maintain and keep track of these publications?" Management system documents are comprised of the laboratory quality manual, appendices, standard administrative procedures (SAPs), good measurement practices (GMPs), good laboratory practices (GLPs), standard operating procedures (SOPs), checklists, and forms, but also include regulations, standards, normative documents, drawings, software, specifications, instructions, and manuals. The management system includes documents from both external and internal sources. External sources may include organizations like NIST, NVLAP, ASTM, OIML, and ISO/IEC to name a few.

ISO/IEC 17025:2005, *General Requirements for the Competence of Testing and Calibration Laboratories*, notes that the term "document" can be broadly applied and includes "policy statements, procedures, specifications, calibration tables, charts, text books, posters, notices, memo-

randa, software, drawings, plans, etc. . ." This broad definition essentially means that laboratories are faced with the task of managing huge numbers of documents in both hard copy and electronic formats.

Not to worry, ISO/IEC 17025:2005 provides an effective tool to keep track of them all…the ***Master List***. The Master List is used to list all of management system documents in one place. All laboratory personnel can go to this list to make sure they are using the correct version of any management document. The Master List specifies the current revision and distribution of each document. Not only does the Master List help prevent invalid or obsolete documents from being used, but helps avoid time-consuming corrective actions.

The Master List may be a stand-alone document or it may be included in a document control procedure (Section 4.3.2.1 b). Laboratories that based their system on the quality manual template (NISTIR 5802, compliant to ISO/IEC Guide 25:1990) will find Master List components located in QM 2 (References and Definitions), Appendix H (Procedures List), and Appendix N (Document Control). *Note*: numbers in parenthesis represent section numbers in ISO/IEC 17025 or NIST Handbook 143.

They say spring is the season to clear out the clutter and streamline our lives. We often apply this idea in our home closets or garages. Since laboratories are required to periodically review management system documents to ensure continuing suitability and compliance with requirements (Section 4.3.2.2), they should apply the house cleaning principle to the Master List as well. Laboratories with large numbers of documents often develop a review schedule to spread their review work throughout the year, making it easier to fit into their busy calibration schedules. Management system document review activities can be summarized and the Master List updated during the annual quality audit.

Laboratories are also guided to use the latest valid edition of standards and methods published in international, regional, or national standards when possible (Section 5.4.2). Current versions of technical, quality, and proficiency testing publications are on the WMD website (http://www.nist.gov/labmetrology). What happens when a new standard or method is issued mid-year? If it is permitted by the laboratory's document control procedure, an authorized individual can review and adopt the procedure, followed by a hand-marked change (with date and signature) on the controlled copy of the Master List, thus designating the new version until the next time the quality manual is updated.

It is important to evaluate whether all Master List documents are necessary and appropriate to the laboratory's current scope and calibration activities. Why maintain procedures for calibrations that are not even performed? Removing unnecessary documents can make an instant impact and streamline document control efforts.

What about obsolete documents or those needed for either legal or historical purposes? These documents are not included in the Master List, but should be suitably marked so laboratory personnel do not mistake them for active documents. Some laboratories have found it useful to designate a well marked storage location for their obsolete and historic documents to help ensure they are not unintentionally used.

New Master List Resource Available Online

WMD has developed a new resource of externally generated metrology publications to assist in developing and reviewing Master Lists. Laboratories should only include documents that are appropriate to the current WMD Recognition or NVLAP Accreditation Scope. Remember, the template Master List is not an all inclusive list, but simply a snapshot in time. Organizations are constantly revising and updating their publications. This list is posted online at the WMD website (http://www.nist.gov/labmetrology).

2007 State Laboratory Workload Survey to be Available Late July

By Val Miller

As of May 11, 2007, all but three of the functioning State laboratories had reported the requested workload data. Those three are encouraged to submit their data as quickly as possible. On May 20 the 2007 State Laboratory Workload Survey website was closed and the data were submitted for analysis. It is expected that analysis of the data and the first round of reviews will be completed by mid-June with publication of the survey data slated for July 1. The survey report will be officially published and made available for general distribution at the 2007 NCSLI Workshop and Symposium in St. Paul, Minnesota, in late July. Each contributing organization will receive two complimentary copies of the final survey report by mail at that time. Additional copies of the survey results will be available after August 15.

One feature of the 2007 State Laboratory Workload Survey will be the additional year's data that was requested. It has been thought by some that a survey conducted every two years may miss significant data because of calibration cycles longer than one year. In this survey report we will have data for the 2004, 2005, and 2006 calendar years as well as that from preceding survey reports. It will be interesting to see how significantly the data from the typical non-reporting year (2005) differ from the data of the 2004 and 2006 years.

Data contained in the 2007 State Laboratory Workload survey will be valuable to metrologists and administrators who are diligently working to maintain their metrology laboratory in a changing/challenging economic environment. The charts and graphs contain valuable information providing metrologists with confidence that laboratories to which they refer a customer are performing sufficient quantities of measurements in a specific measurement area to maintain proficiency. Administrators can compare with confidence their laboratory's fee schedule and other economic data to laboratories performing similar services to ensure they are operating their laboratory in the most

fiscally responsible manner possible, ensuring their taxpayers are receiving the most benefit for the dollars expended.

The 2007 State Laboratory Workload Survey report is possible only with the cooperation and assistance of all the dedicated individuals who gathered and entered the data for their individual laboratories. The survey committee wishes to express thanks to those individuals who contributed data.

Calendar of Events

2007

JUNE

25 – 28
Course 302 – Retail Motor-Fuel Dispensers and Consoles
OH Department of Agriculture Laboratory
Reynoldsburg, OH
Contact: Ken Wheeler , 614-728-6290 or kwheeler@mail.agri.state.oh.us

25 – 28
NIST Handbook 133 Class – Checking the Net Contents of Packaged Goods
Tennessee Department of Agriculture
Ellington Agriculture Center
Nashville, TN
Contact: Tom Coleman, 301-975-5868 or t.coleman@nist.gov

JULY

8 – 12
NCWM 92nd Annual Meeting
Snowbird Resort
Salt Lake City, UT
Contact: NCWM, 240-632-9454 or www.ncwm.net

29 – August 2
NCSL International Workshop & Symposium
St. Paul River Centre
St. Paul, MN
Contact: NCSLI, 303-440-3339 or www.ncsli.org

AUGUST

20 – 24
Southeast Ohio Regional Training Seminar
Course 203 - Medium Capacity Scales
Athens, OH
Contact: Ken Wheeler , 614-728-6290 or kwheeler@mail.agri.state.oh.us

22 – 23 (tentative)
NTETC Grain Analyzer Sector Meeting
Kansas City, MO
Contact: Diane Lee (NIST), 301-975-4405 or diane.lee@nist.gov or Jack Barber at jbarber@motion.net

SEPTEMBER

6 – 9
NCWM NTETC Weighing Sector Meeting
Marriot Scaramento Rancho Cordova
Rancho Cordova, CA
Contact: NCWM, 240-632-9454, NCWM@mgmtsol.com

9 – 13
Western Weights & Measures Association (WWMA) Annual Meeting
Harveys Lake Tahoe
Lake Tahoe, NV
Contact: Steven Grabski, 775-688-1166, sgrabski@agi.state.nv.us

10 – 14
SWAP Regional Metrology Training
Regional Members Only
Las Cruces, New Mexico
Contact: Steve Sumner, 505-646-1616, ssumner@nmda.nmsu.edu

12 – 13
Small Volume Prover Training
Reynoldsburg, Ohio
Contact: Diane Lee, 301-975-4405 or diane.lee@nist.gov

16 – 19
Central Weights & Measures Association (CWMA) Interim Meeting
The Lodge
Bettendorf, IA
Contact: Tim Tyson 785-862-2415 or ttyson@kda.state.ks.us

17 – 19
OIML TC 6 Meeting (Prepackaged Prorducts)
NIST
Gaithersburg, MD
Contact: Tom Coleman, 301-975-4868 or t.coleman@nist.gov

17 – 21
NEMAP Regional Metrology Training
Regional Members Only
Connecticut
Contact: Mike Dynia, 860-713-6165, michael.dynia@po.state.ct.us

20 - 21
OIML TC 17/SC 8 Meeting (Instruments for Quality Analysis of Agricultural Products)
NIST
Gaithersburg, MD
Contact: Diane Lee, 301-975-4405 or diane.lee@nist.gov

24 – 28 (tentative)
Train-the-Trainer Handbook 133 Class (Checking the Net Contents of Packaged Goods)
Attendance by Invitation Only
Nashville, TN
Contact: Tom Coleman, 301-975-4868 or t.coleman@nist.gov

24 – 25
OIML TC 17/SC 1 Meeting (Humidity)
NIST
Gaithersburg, MD
Contact: Diane Lee, 301-975-4405 or diane.lee@nist.gov

24 – 28
Northwest Ohio Regional Training Seminar
Course 203 - Medium Capacity Scales
Findlay, OH
Contact: Ken Wheeler , 614-728-6290 or kwheeler@mail.agri.state.oh.us

OCTOBER

1 – 5
Southwest Ohio Regional Training Seminar
Course 203 - Medium Capacity Scales
Wilmington, OH
Contact: Ken Wheeler , 614-728-6290 or kwheeler@mail.agri.state.oh.us

15 – 19
MidMAP Regional Metrology Training
Regional Members Only
Minnesota
Contact: Bruce Adams, 651-284-4104, bruce.adams@state.mn.us

19 – 20
NCWM NTETC Measuring Sector Meeting
Doubletree Hotel
Little Rock, AR
Contact: NCWM, 240-632-9454 or NCWM@mgmtsol.com

21 – 24
Southern Weights & Measures Association (SWMA) Annual Meeting
Doubletree Hotel
Little Rock, AR
Contact: Tim Chesser, 501-570-1159, tim.chesser@aspb.ar.gov

22 – 23
National Industrial Scale Association (NISA) 2007 Fall Technical Program
Hotel: TBD
Milwaukee, WI
Contact: www.nisa.org

22 – 26
PA Association Weights & Measures 2007 Training Conference
Best Western Eden Resort Hotel
Lancaster, PA
Contact: Dean F. Ely, 570-398-2811 or www.pawm.org

29 – November 2
Basic Mass for Industry
NIST, Gaithersburg, MD
Contact: Val Miller, 301-975-3602 or val.miller@nist.gov
Applications at: http://www.nist.gov/lab-metrology

NOVEMBER
5 – 9
Intermediate Metrology **(CANCELLED)**
NIST, Gaithersburg, MD
Contact: Val Miller, 301-975-3602 or val.miller@nist.gov for available alternative training

14 – 16
Scale Manufacturers Association (SMA) Fall Meeting
Hilton Chicago O'Hare Airport Hotel
Chicago, IL
Contact: Phil Hannigan, 239-514-3441 x12 or phil@scalemanufacturers.org

26 – 30
Northeast Ohio Regional Training Seminar
Course 203 - Medium Capacity Scales
Akron, OH
Contact: Ken Wheeler , 614-728-6290 or kwheeler@mail.agri.state.oh.us

DECEMBER
3 - 7
Central Ohio Regional Training Seminar
Course 203 - Medium Capacity Scales
Reynoldsburg, OH
Contact: Ken Wheeler , 614-728-6290 or kwheeler@mail.agri.state.oh.us

2008

JANUARY
27 – 30
NCWM Interim Meeting
Hyatt Regency Albuquerque
Albuquerque, NM
Contact: NCWM, 240-632-9454 or www.ncwm.net

FEBRUARY
Exact Date: TBD
National Weighing & Sampling Association (NWSA) Technical Meeting
St. Louis, MO
Contact: www.nwsa.org

25 - 29
Advanced Mass Hands-On
NIST, Gaithersburg, MD
Contact: Val Miller, 301-975-3602
Applications at: http://www.nist.gov/lab-metrology

MARCH
10 – 14
Measurement Science Conference (MSC)
Anaheim, CA
Contact: 866-672-6327 or www.msc-conf.com

APRIL
7 – 18
Basic Mass for States
NIST, Gaithersburg, MD
Contact: Val Miller, 301-975-3602 or val.miller@nist.gov
Applications at: http://www.nist.gov/lab-metrology

16-18
Scale Manufacturers Association (SMA) Annual Meeting
Sundial Beach & Golf Resort
Sanibel Island, FL
Contact: Phil Hannigan, 239-514-3441x12 or phil@scalemanufacturers.org

MAY
12 - 16
Basic Mass for Industry
NIST, Gaithersburg, MD
Contact: Val Miller, 301-975-3602 or val.miller@nist.gov
Applications at: http://www.nist.gov/lab-metrology

JULY
13 – 17
NCWM 93rd Annual Meeting
Sheraton Burlington Hotel & Conference Center
Burlington, VT
Contact: NCWM, 240-632-9454 or www.ncwm.net

AUGUST
3 – 7
NCSL International Workshop & Symposium
Walt Disney World Swan & Dolphin
Orlando, FL
Contact: NCSLI, 303-440-3339 or www.ncsli.org

NOVEMBER
3 - 7
Basic Mass for Industry
NIST, Gaithersburg, MD
Contact: Val Miller, 301-975-3602 or val.miller@nist.gov
Applications at: http://www.nist.gov/lab-metrology

DECEMBER
8 – 12
Intermediate Metrology
NIST, Gaithersburg, MD
Contact: Val Miller, 301-975-3602 or val.miller@nist.gov
Applications at: http://www.nist.gov/lab-metrology

For meetings and events for the **American Petroleum Institute (API)**, please check the API website at www.api.org and click on the Meetings and Training Section under the "Energy Professional Site" bullet on the left-hand portion of the home page. Information for **American Society for Testing and Materials (ASTM)** meetings is available at www.astm.org on their Internet website. Click on the "Meetings" bullet on the left-hand portion of the home page. These meetings and seminars are updated on a continuous basis.

National Standards Institute (ANSI), click on the "Meetings and Events" bullet on their website at www.ansi.org. For information regarding **American** information regarding the National Conference on Weights and Measures (NCWM), please check the NCWM website at www.ncwm.net.

If you want your meeting, conference or training session included in the Calendar of Events, please contact Lynn Sebring, 301-975-4006 (email: lynn.sebring@nist.gov).